

Final Exam Review Notes

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These notes are not a full catalogue of the course content; the lecture notes on the website provide a more complete record. However, you might find these notes useful for a compact summary of the ground we've covered.

1 First Half of Semester

1. How are the returns to skills determined?

- We can think of this as a supply and demand problem. The relative wage of high-skilled people is on the vertical axis, and the relative quantity of skilled people is on the horizontal axis.
- The higher the skill premium is, the more firms will substitute low-skill workers for high-skill workers. This gives us the demand curve.
- The supply curve comes from individuals' human capital investment decisions. Starting at (say) age 18, each individual maps out their earnings profile if they invest in skills and if they don't. They should invest if and only if that earnings profile has a higher *present value*.
 - The tradeoff is between higher earnings in the future and lower earnings today (while you are in school, not working and paying tuition).
 - People from poorer households may have higher discount rates

2. How have returns to skill evolved?

- The college premium was stable or falling prior to 1980. Between 1980 and 1985, it shot up, and it has been increasing more slowly since then.
- There has also been an increase in the measured return to cognitive skills (mathematics test score in Murnane, Willett & Levy, 1995).
- We can be a little more specific: it is largely the "bottom middle", and not the very bottom, that has lost out over the past several decades. Good blue collar jobs in manufacturing and the more routine white collar jobs have disappeared.
- At the same time, a lot of the gains have gone to the very top of the distribution: in many fields, the best paid do *far* better now than a few decades ago.

3. What caused the increase in the return to skill?

- In the context of the supply & demand model, we know that the demand curve must have shifted out. (If supply had shifted in, we would observe a decrease in the proportion of people going to college, which we don't.)
 - Leading theories for the increase in demand: technology (especially computers); trade and outsourcing; breakdown of institutions that constrained inequality.
 - Technology: The idea is that computers can perform routine cognitive tasks much more efficiently than humans can, but they aren't as good at more advanced tasks (that would often be performed by college-educated workers).
 - Trade and outsourcing: Poor countries have an abundance of low-skill labor. As barriers to trade fall away, goods/tasks produced by low-skill workers are being moved to these poor countries where the labor is very cheap. High-skill work is harder to move for at least two reasons. 1) Poor countries have a scarcity of high-skill labor; it isn't as cheap as low-skill labor relative to the U.S. 2) When individual tasks (rather than the production of entire goods) are moved offshore, it is very important that firms be able to accurately communicate the specifications. Communication is far easier when the task can be broken into routine components, and this is usually easier for the tasks performed by low-skill workers. In this way, both technology and outsourcing can substitute for similar sets of tasks.
 - Institutions: Tax progressivity, minimum wages, unionization, and non-market wage-setting norms within firms have all become weaker. This might have increased inequality between the skilled and the unskilled.
 - One piece of data that suggests there is something to the technology or outsourcing stories: the proportion of "routine cognitive" tasks in people's jobs has fallen by a lot since 1969, to be replaced by "expert thinking" and "complex communication" tasks.
4. Have the kinds of skills that are rewarded changed?
- The data on job tasks mentioned above suggests that there is now greater emphasis on non-routine cognitive skills. (Non-routine manual skills, like many trades, seem to have decreased in importance.)
 - An important challenge for education is to figure out how to teach these skills.
5. Can we trust that estimated returns to skill are really causal?
- Is the earnings gap between college-educated labor and high school-educated labor the same as what I could get by going to college? Or is it just that high-wage people self-select into college?

- This was our first big econometric problem. We looked at two papers that tried to answer the question:
 - Card uses proximity to college as an instrumental variable for how much schooling a person gets. (Live close to college⇒More likely to go to college⇒Earn more money?)
 - Duflo uses difference-in-differences in the context of an Indonesian school construction program. (More schools built in your district⇒Larger increase in schooling levels in your district⇒Faster wage increases among people from your district?)
 - The reason we worry about this issue is that we can't map changes in the observed returns to skill to our supply and demand model if there is substantial ability bias. (It could just be that ability bias has got worse over time, and we want to rule out that explanation.)
6. If they are causal, are they due to signaling or to human capital accumulation?
- If you didn't learn anything in college, might you still want to go? The answer could be yes: by going to college, you prove that you are bright, motivated, and willing to conform to a set of social expectations. People who have those traits might be more valuable to employers, *even if the college experience itself does nothing to increase those traits.*
 - This is distinct from the previous issue. Ability bias and signaling both mean that the college wage premium isn't coming from new skills that are learned in school. However, ability bias means that going to school doesn't have a causal effect on my earnings, or at least not as large an effect as we estimate by comparing earnings of college grads to earnings of non-college grads. If the signaling story is true, then going to school still has a big causal effect on my earnings; but the reason is that I'm changing employers' perceptions of my skills (and not changing my skills *per se*, as human capital theory posits).
 - We saw some evidence for signaling with the GED: white dropouts who get a GED just because of their state's lax passing standards have substantially higher earnings. There was not observed effect for minority dropouts.

2 Second Half of Semester

1. What is the effect of class size on achievement?

- Idea is that teachers can give more individualized attention in smaller classes
- Hanushek: smaller classes don't have higher achievement
- STAR experiment: students randomly placed in a smaller class in Kindergarden have higher test scores
 - The "kick" seems to come largely at the beginning; kids in smaller classes don't have a persistently higher growth rate in achievement. This fact might account for some of the discrepancy between Hanushek and Krueger.

2. School choice

- Voucher vs. open enrollment systems: vouchers give money for private schools, open enrollment just allows students to attend the public school of their choice.
- Issue we looked at in readings: do the transferring students benefit?
 - Conflicting evidence. Greene, Peterson & Du find a large benefit; Rouse finds more modest benefits; and Cullen, Jacob & Levitt find minimal benefits on academic outcomes.
 - Side issue: Take up with this kind of program is imperfect. The thing we can randomize is the opportunity for school choice, not going to a new school *per se*; that means that our regressions should treat the opportunity (e.g., winning a lottery) as the causal variable. But that's OK: the real effect of the policy includes the fact that many people will refuse to take up the offer.
- Also other issues relevant to evaluating this policy:
 - Effects on other students
 - Effects on the incentives of schools

3. School accountability

- Tradeoff between three goals: 1) want to provide incentives for schools to exert effort, 2) don't want to incentivize perverse effort, and 3) want to be fair. Accountability programs help to achieve (1), but the concerns are that they hurt goals (2) and (3).
- Looks like incentives do improve performance on the high-stakes tests that affect rewards.
- Brian Jacob finds that in Chicago, there were perverse responses: teachers "taught to the test" and put some kids into Special Ed or retained them. There were no gains on a low-stakes exam.
- Important design issue to consider: how do you design a program to maximize (1) while minimizing damage on (2) and (3)?

4. Teacher training and teacher quality

- There is some evidence that top female students are less likely to enter teaching than they used to be. A plausible explanation is that they now have better-paying opportunities in other fields.
- Supporting this hypothesis, Loeb & Page find that increases in wages for teachers—relative to wages of female college graduates in other occupations—are correlated with improvements in student outcomes, and they attribute this correlation to improved teacher quality.
- On the other hand, we didn't see much evidence that teacher training and certification are beneficial.
 - Kane, Rockoff & Staiger find that there is little difference in quality across teachers of different levels of certification. That is, the uncertified or alternatively certified teachers that schools actually hire do just as well as the certified teachers that they hire.
 - Murnane & Levy talk about the low quality of many teacher training programs. But this doesn't mean that training can't be done well, and there are examples of more effective programs.

5. Use of computers in the classroom

- Some advantages of computers are that they can free up teacher time, increase consistency, and potentially provide a more interactive learning experience than "chalk and talk."
- The deep disadvantage is that computers have to follow a much simpler and less flexible algorithm than a human teacher. There is a risk that they train a narrow set of skills but fail to inculcate the kind of "expert thinking" we discussed earlier in the course.

6. The higher education system

- The main policy question here is, how do you get more people into college and completing their degree?
- We looked at two interventions, with some evidence of success for both:
 - Scholarships to subsidize higher education
 - Remedial programs to help underprepared students

3 An Additional Miscellaneous Issue to Consider

In addition to deciding what kinds of investments we want to make, we must also decide *when* to invest.

- Early childhood: we saw some evidence that skills at early ages predict performance much later on. Maybe the most efficient investment is to get people really well prepared to learn.
 - Perry Preschool and ABCDERIAN: very promising results, though the samples are quite small.
- On the other end, we could target post-secondary. Maybe now that the return to a college education has gone up, we should just focus on getting more people to complete their college degree.
- Or we could take the more traditional approach and target K-12 education; we discussed many possible K-12 reforms that would require additional resources.

Important considerations in deciding from among these options: appropriate discount rate; fairness (equal opportunity at early ages?); the costs and benefits of each program.