ECO 450G Notes - Spring 2003 Semester – March 6, 2003

Chapter 8 – Education and Ability

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I. Education and Income

The goal of this chapter is to discuss whether (1) educational achievement determines who is poor, and (2) whether the level of educational achievement determines how many people are poor.

The correlations between education and earnings are notable. In 1998, Schiller reports that men who graduated college earned more than $63,000, while high-school graduates earned about $29,000, and high-school dropouts earned $19,000. See Table 8.1.

> The data focuses on men between ages 25 and 64, so that for the most part school decisions are completed. These earnings numbers include both workers and non-workers (who count as zero earnings). Thus, the fact that earnings of college graduates are double that of high school graduates comes, in part, from the much lower labor force participation rate (76.2% according the table) than for college graduates.
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> Note that virtually all college-graduate men are in the labor force (e.g. employed or looking for work), and that the unemployment rate in 1998 was very low – 1.6%. The labor force participation rate for high-school graduates – 76.2% – seems suspiciously low, and is not much different than that for high-school dropouts. The unemployment rates for these two groups are 3.9% and 6.3% in 1998, respectively.
>
> There is also substantial variation in the fraction of full time workers.

As with earnings, poverty rates vary with educational attainment – they are 23.4% for families headed by a high-school dropout, and are only 3% for college graduates.

Labor-Market Effects

Education contributes to earnings in several ways:

> Human capital – presumably you learn things in school, like critical thinking, that increase your value and productivity in the marketplace.
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> Schooling can be a signal – you had the perseverance to work hard and finish. Issues about *selection bias* enter here – those who are more "able" are likely to pursue more education, so a degree may signal that underlying characteristic.
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> Schooling can provide a network – for example, job placement services or knowing recent college graduates who are at a firm.

Note that all of these arguments, however, seem more applicable for finishing college than

finishing high school, yet we still see dramatic differences in earnings between high school drop-outs and high-school graduates.

Schiller reports that over a lifetime, college graduates can expect to earn $600,000 more than high-school graduates.

Increasing Skill Premiums

One notable trend in the CPS data over the last several decades is growing inequality – for example, the earnings gap between better- and less-educated workers. Schiller reports that in 1973, college graduates earned an average of 46% than high school graduates, and that this premium had increased to 53% in 1989. Note that Schiller's Table 8.1 would suggest a premium on the order of 100%, but the numbers there are almost surely incorrect.

In addition, there is also growing inequality within education (skill) groups over time.

Why?

Schiller cites on page 144 the "increased wage premiums paid to better-educated workers reflect an increased demand for skilled labor." Be careful to note this quote, because it is not entirely consistent with his discussion of "bumping down" on pages 148-9. The current assertion – about the increasing returns to skill – is probably correct.

What are some of potential factors that have raised the skill premium?

- Technological advances
- International competition and trade– see http://www.nber.org/reporter/spring01/hanson.html for a detailed description. When U.S. firms fragment production internationally, they typically move less skill-intensive activities abroad and keep more skill-intensive activities at home. Foreign outsourcing of this type can change the demand for skilled and unskilled labor and alter the structure of wages both at home and abroad. More trade with low-wage countries is one possible factor behind rising wage inequality. What complicates identifying the impact of trade on wages is that other profound shocks to labor markets have occurred at the same time. The advent of information technology, for instance, appears to have increased the demand for skilled labor and allowed firms to eliminate many jobs performed by the less skilled
- Changes in the mix of output

What are the factors that have kept wages for unskilled jobs low?

- Immigration
- Imports of low wage goods from other countries

There are also compositional changes in those who finish high school or college over a long period of time. How would these compositional changes affect the wage differential? The argument here is analogous to the one we made with the "hiring queue" in Chapter 3. As more people go on to college, the average innate ability of college-attenders falls. This would suggest that by "watering-down" the pool of college-attenders, the wages for college attenders is actually understated. On the other hand, to the extent that those who are newly attending college were the most able of the high-

school graduates, the average wages of the remaining high school graduates also falls. The impact on the wage differential is therefore ambiguous – both wages fall as a result of compositional changes, and which one falls more is an open question.

II. Paths of Causation

Does schooling "cause" higher earnings? If so, then the flawed character argument would suggest that those who choose to not pursue education will be the ones who are poor.

Schiller, by and large, tries to make the argument that education is not perfectly correlated with higher earnings (and as a consequence, Schiller would like to dismiss the "flawed character" argument). His argument, which seems extreme, is that unless everyone's income is raised by education (and raised equally), then we cannot blame the poor for not getting more education.

Overlapping Causes

Schiller correctly points out on page 144 that not all of the income differences between more- and less-education are due to schooling, per se. Individual traits (such as ability and motivation) along with external environment, also determine earnings. If we do not account for these other factors, we likely overstate the true return to education.

- Education, in this case, serves to certify who had the most talent and best circumstances anyways.

- There is a lengthy economic literature that tries to find factors that influence the number of years of education, but are unrelated to underlying ability or circumstances. For example, Angrist and Kruger (Quarterly Journal of Economics, 1991) show a relationship between quarter-of-birth and educational attainment that is induced by compulsory schooling laws.

Schiller notes that "there will be plenty of variation in incomes even among individuals with identical education. Likewise, even if, on average, better-educated individuals can earn more money, all persons will more schooling will not necessarily have higher incomes." There will be some high school dropouts that earn more than some college graduates, and the impression that one gets is that Schiller believes this is an indictment on the idea that education can explain poverty.

It is pretty obvious that there is not only one predictor of income, and years of schooling has plenty of flaws. In studies of individuals, as opposed to groups, educational attainment accounts for a very small proportion of the variation.

- Sidenote: In econometrics and statistics, we use R^2 to explain the proportion of variation – with values approaching 1.0 explaining more and values approaching 0.0 explaining less. Virtually all individual-level studies – regardless of the outcome, do not come close to explaining 100% of the variation in the data, so this quote needs to be taken in the context of statistical models more generally. R^2 is different from *statistical significance* however – where we can reject the hypothesis that education has a return of

0%.

Schiller shows race and gender differences in Figure 8.2 and Figure 8.3, respectively from the 1998 CPS. He emphasizes the fact that holding educational groupings constant, white men earn more than black or hispanic men, and that men earn more than women. These are obviously true, but he concludes "education does not guarantee a higher income or escape from poverty." His criteria, it seems, for whether education raises income, is that all groups – by race and gender, and presumably any other demographics – have equal earnings.

- This is an extremely stringent criteria. It obviously does not account for *preferences* – for example, part of the large male-female gap in 8.3 is presumably because of women out of the labor force because of child-bearing.
- In all cases, the *derivative* on educational attainment is positive – holding constant other circumstances, education does pay (on average).
- Note that education is grouped into several year-groupings, e.g., 9-11, 12, 13-15, 16+. Could this help explain some of the earnings gaps? Probably. It is likely that within any grouping (e.g., 9-11 or 13-15), that blacks and Hispanics have a greater proportion of individuals at the lower end (e.g., 9 years or 13 years) than whites. Thus, it is possible that part of the gap comes from comparing the earnings of blacks and Hispanics with lower educational attainments, but grouping them into the same educational attainment as whites.
- It is not clear in Figure 8.2 or 8.3 how the $63,000 earnings average is constructed for college graduates – because it presumably should be a weighted average of the earnings for white, black and Hispanic college graduates – all of which seem to be considerably under $63,000.

Education as a sorting device

When there is excess supply of job applicants, how do employers proceed in making hiring choices?

- The Hiring Queue – as in chapter 3, it is suggested here that firms hire employees with the most human capital (using education as a proxy). Thus, those who have less formal education but are potentially capable of doing a job may not get it.
    - This seems like it should be more true for white-collar jobs and less true for blue-collar jobs.
- The "Sheepskin" effect basically suggests that diplomas are admission tickets for job interviews.
- Bumping down – As the supply of education workers increases, employers may rachet up hiring prerequisites. In the process, college graduates may take an increasing share of the jobs lesser-educated workers would have performed. Pryor and Schaffer (1999) call this process "bumping down" and claim that it explains why the less educated have a hard time finding jobs. Schiller says "It isn't that low skill jobs are disappearing, but rather that higher-skilled workers are taking them because the supply of educated workers has grown faster than the demand for them." This is not entirely in accord with the earlier discussion about the skill premiums. Moreover, it is a very-short run

argument – if education increases productivity and therefore leads to economic growth, then in the medium-run and long-run, the "bumping" down would not happen. Moreover, it ignores the possibilities for self-employment.
- The content of education – we measure education in years, but that is only one way to evaluate individuals. The curriculum and quality of school should clearly matter too.

III. Ability and Income

We use the term ability, when we usually refer to the combination of innate capacity and developed performance. Ability is multidimensional – e.g., it is not one all-inclusive measure. The ability to sing or run is distributed differently than the ability to solve complex mathematical problems.

Two measures that are often used to proxy for ability are IQ and education. Schiller's Figure 8.4 shows three different distributions – the distribution of earnings, of education, and of IQ. He notes that the education distribution is not "bell-shaped" but rather has large spikes at 12 and 16 years of education. Moreover, even though the earnings and IQ distribution do have more of a bell shape, the distributions are not identical to each other.

Schiller says "These differently shaped distributions suggest that the links between ability and income are far from perfect." He also says later "educational attainments depart considerably from the IQ distribution, suggesting that access to, and quality of, education are not uniform."

- Recall that there is an element of choice in earnings – some people *choose* not to work full-time, full year.
- Even if the IQ and earnings distributions were identical to each other, it is not at all obvious that they map into each other.
- If one drew a scatter plot of IQ or education and incomes, one would surely see a positive relation.
- The distribution of education (in years) is not bell shaped for a variety of reasons – so it is not clear what the point of the exercise is.