

## Chapter 9 – Education and Ability

### I. Education and Income

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### III. Ability and Income

#### I. Education and Income

Does education determine who is poor and how many people are poor?

The correlation between education and earnings is strong. In 2000, Schiller reports that men who graduated college earned more than \$50,000, while high-school graduates earned about \$31,000, and high-school dropouts earned \$21,000. See Table 9.1.

- The data focuses on men between ages 25 and 64, so school decisions are mostly completed. These earnings numbers include both workers and non-workers (who count as zero earnings). The fact that earnings of college graduates are nearly double that of high school graduates comes, in part, from the much lower labor force participation rate (85.7% according the table) than for college graduates.
- Virtually all college-graduate men are in the labor force (e.g. employed or looking for work), and the unemployment rate in 2000 was very low – 1.5%. The labor force participation rate for high-school graduates is higher than for dropouts. The unemployment rates for these two groups were 3.4% and 5.5% in 2000, respectively.
- Variation in the fraction of full time workers.

As with earnings, poverty rates vary with education – they are 22.2% for families headed by a high-school dropout, and are only 3.2% for college graduates.

#### *Labor-Market Effects*

Education contributes to earnings in several ways:

- **Human capital** – You learn things in school, like critical thinking, that increase your value and productivity in the marketplace.
- **Signaling** – You had the perseverance to finish school. *Selection bias* plays an important role: more “able” individuals are likely to pursue more education, so a degree may signal that underlying characteristic.
- **Networking** – Colleges have job placement services and alumni who work at

desirable firms.

Most of these arguments seem more applicable to **finishing college** than finishing high school, yet there are large earnings differences between high school dropouts and high-school graduates. Schiller reports that over a lifetime, college graduates can expect to earn **\$800,000** more than high-school graduates (in an earlier edition, he said \$600,000).

### *Increasing Skill Premiums*

The CPS data over the last several decades reveal growing inequality in income, such as the earnings gap between better- and less-educated workers. Schiller reports that in 1975, college graduates earned 50% more than high school graduates, and that this premium had increased to 80% in 1999.

- Schiller's Table 9.1 implies a premium of 65% using the 2000 data. *Why is that number different from the 80%?*

*Skills matter:* Schiller says on page 158: the "increased wage premiums paid to better-educated workers reflect an increased demand for skilled labor." This is not entirely consistent with the "bumping down" discussion several pages later. The current assertion – about returns to skill – is probably correct.

### *Why has the return to skills increased?*

- 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 output mix

### *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 an earlier chapter. As more people go 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 uncertain – 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 tries to make the argument that education is not **perfectly correlated** with higher earnings (and as a consequence dismiss the “flawed character” argument).

His argument, which is 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 159 that not all of the income differences between more and less-education are due to schooling. Individual traits (such as ability and motivation) along with external environment, also determine earnings. If we do not account for these other factors, we **overstate** the true return to education.

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

Schiller notes on page 160 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.” Some dropouts will earn more than some college graduates, and the impression is that Schiller believes this is an indictment on the idea that education can explain poverty.

- It would be shocking if there was just one predictor of income, and years of schooling has flaws. In studies of individuals, as opposed to groups, educational attainment accounts for a **very small proportion** of the variation (e.g., the R-squared).

In econometrics and statistics,  $R^2$  is used to explain the proportion of variation – with values approaching 1.0 explaining more and values approaching 0.0 explaining less. Most 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.  $R^2$  differs from statistical significance however – where we can reject the hypothesis that education has a return of 0%.

Schiller shows race and sex differences in Figures 9.2 and Figure 9.3, respectively from the 2000 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.

In an earlier edition, Schiller concluded “education does not guarantee a higher income or escape from poverty.” In this edition (p. 160), he says “Although lack of education is certainly an explanation for poverty, that explanation is far short of complete.”

Schiller’s criterion on whether education raises income is that all groups – regardless of race or sex – have equal earnings.

- This is an extremely stringent. It does not account for **preferences** – for example, part of the male-female gap in Figure 9.3 is due to women out of the labor force because of child-bearing.
- The return on educational attainment is positive – holding constant other circumstances, education does pay (on average).

Education is grouped into several clusters, like 9-11, 12, 13-15 and 16+. Could this help explain some of the earnings gaps by race? Within any grouping (e.g., 9-11 or 13-15), blacks and Hispanics tend to be over-represented at lower end (e.g., 9 years or 13 years) than whites. 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**. Notice the vertical distance gets a little bit smaller for 12 years, versus 9-11 year.

- Are the numbers for college graduates in Figure 9.2 consistent with Table 9.1? In Figure 9.2, we’re looking at mean earnings, not median earnings. The mean is higher than the median due to outliers at the top of the earnings distribution.

### *Education as a sorting device*

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

hiring choices?

- **The Hiring Queue** – Schiller suggests 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 more applicable for white-collar jobs than blue-collar jobs.

- **“Sheepskin” effect** suggests that diplomas are admission tickets for job interviews.
- **Bumping down** – As the supply of educated workers increases, employers may ratchet 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. As the supply of educated workers has grown faster than the demand for them, more educated workers have moved down the occupation ladders.”

This is not consistent with the earlier discussion about the skill premiums.

It is also a very-short run argument – if education increases productivity and leads to economic growth, then in the medium-run and long-run, the “bumping” down would not happen. The argument also 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**

Ability refers to a combination of innate capacity and developed performance. Ability is multidimensional. The ability to sing or run is distributed differently than the ability to solve complex mathematical problems.

- 2 measures that proxy for ability are IQ and education. Schiller’s Figure 9.4 shows 3 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. Even though the earnings and IQ distribution do have more of a bell shape, the distributions are not identical to each other.

Schiller says (p. 167) “These differently shaped distributions suggest that

the links between ability and income are far from perfect.” He also says “educational attainments depart considerably from the IQ distribution, suggesting that access to, and quality of, education are not uniform.”

- 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, these are overlapping histograms, not a scatterplot. You could have distributions that look similar if, for example, education and earnings were perfectly negatively correlated with each other.
- If one drew a scatter plot of IQ or education and incomes, there would be a positive relation.
- The distribution of education (in years) is not bell shaped for a variety of institutional reasons – so it is not clear what the point of the exercise is.