

14.48, Economics of Education
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Lecture 20

Regression Model to measure the effectiveness of individual teachers:

$$Test_{(i, June 2007)} = \begin{bmatrix} \text{Characteristics} \\ \text{of} \\ \text{Student} \end{bmatrix} + \begin{bmatrix} \text{Characteristics} \\ \text{of} \\ \text{Other} \\ \text{Students} \end{bmatrix} + \begin{bmatrix} \delta_1 \\ \delta_2 \\ \dots \\ \delta_j \end{bmatrix} + \begin{bmatrix} \text{Teacher} \\ \text{Variables} \end{bmatrix} + Test_{(i, June 2006)}$$

Why do we add the characteristics of the other students in the class? Because the quality of the other students in a classroom can affect teaching methods and the quality and effectiveness of those methods. Uncertified teachers often teaching the low achieving students. More generally, teacher assignments are NOT random.

Separate regressions for each of two years:

$\delta_{k,2007}, \delta_{k,2006}$ represent the teacher effects

Ideally, we are looking for a high correlation between the two coefficients to prove that there *is* a teacher effect.

However, if the coefficients are not highly correlated, you could be working with poor data or measuring the wrong thing. Alternatively, teachers could just have good years and bad years.

There was a .3SD measured difference in student test score outcomes between teachers in the top quartile and teachers in the bottom quartile, similar to the difference between students in small and large class sizes.

Which is more expensive, small class sizes or better teachers? Not clear that one is significantly and consistently more expensive than the other.

How do you expand the teacher hiring pool?

Alternative certification is much faster than traditional certification methods. Teach for America is a program that offers temporary and quick certification. Essentially, they are taking in a set of people who want to teach for a few years, but likely wouldn't have otherwise if they had to go through the traditional certification process.

Are there simple ways to distinguish between good teachers and bad teachers?

Traditionally, teachers were hired on the basis of whether or not they were certified. In other words, certification was used as a signal for teaching skills. Does teacher certification have value?

Let's look at the following groups of teachers:

- 1) Certified
- 2) Teach for America
- 3) NY Teaching Fellows
- 4) International
- 5) Uncertified

Now, how do we test for differences among teachers with different certifications? We use a set of 4 dummy variables for all but one of the different types of certification. We also drop the individual teacher variables in our regression. We aren't interested in the effects of individual teachers, just the effects of different types of certification.

We omit the certified group.

$$Test_{(i, June\ 2007)} = [Student\ Characteristics] + [Characteristics\ of\ Other\ Students] + [Certification\ Dummies] + Test_{(i, June\ 2006)}$$

Certified teachers are the baseline comparison for this regression. Therefore, the coefficients for the certification dummies reflect the difference between the performance of students taught by a traditionally certified teacher and the four other certification methods.

Certification Method	Math
TFA	.031 (.009)
Fellow	.04 (.05)
International	.029 (.008)
Uncertified	.001 (.003)

How do we interpret these results?

They have been transformed into an SD variable. Therefore, the TFA teachers have an effect of +.03SD over certified teachers, which is about 1/10 of the effect of having a good teacher versus having a bad teacher. Overall, these results tell us that certification status cannot be used as a way of separating good teachers from bad teachers.

Solution?

- Increase the pool of teaching applicants
- Hire more new teachers
- Base tenure decisions on performance in the classroom after the first few years on the job

How can we relate this discussion to the news about Marilee Jones?

There was no college education requirement for the secretary job that Marilee Jones first applied to at MIT. However, since she lied of her resume, when promoted to other upper level jobs, people assumed that she met the academic qualifications for those jobs.

Why would MIT or any other school want their Dean of Admissions to have a BA?

First, they would want that person to have gone through the undergraduate experience to be able to relate to what these students are applying for. Second, on average, a randomly chosen person with a HS diploma would be less qualified than a randomly chosen person with a BA. Therefore, if you require at least a BA for the job, then you are saving yourself time spent weeding out unqualified HS applicants.

What should you do with someone who has falsified his or her credentials?

-Make her resign to protect the Institute's integrity and make sure that other's do not have incentive to lie of their resumes

-What about her 30 years of good work?

-She is also very likely a desirable candidate for jobs at other schools because of those 30 years of experience

-Sometimes, you just can't weaken an institution for the sake of one individual

Currently, in the US public schools, the default decision for teacher tenure is less. A teacher would really have to screw up in his or her first few years not to get it.

Proposed change:

Your first 203 years of teaching performance determine the outcome of your tenure decision. Schools should drop the bottom 20-30% of the new teacher cohort.

Overtime, the stock of teaching in the US will be upgraded to higher quality, higher performing teachers.

Loeb and Page:

The impact of wages on: -test scores
 -drop out rates

Hanushek would probably respond negatively to a plan to increase wages of teachers for the sake of increasing test scores and decreasing drop out rates. His basic stance is that resources do not effect outcomes in most cases because they are not used efficiently.

$$\textit{Test Scores} = f(\textit{Teacher Quality})$$

And

$$\textit{Teacher Quality} = f(\textit{Wages})$$

Loeb and Page argue that we need to focus on more than just wages for teachers. We need to put those wages in the context of the current wages for other jobs, the cost of living in the area around individual schools, and basic differences between schools including quality of the facilities, behavior of the students, other benefits offered, etc

One alternative to hiring a large crop of new teachers in retraining existing teachers to help them become better teachers.

The current popular training method involves one day, lecture style conferences that present new teaching techniques to a large group of teachers. They are giving no help in implementing these news methods or giving any formal time to practice them. This can easily lead to frustration, causing teachers to go back to their old methods. Teacher training needs to be in the spirit of kaizan, the Japanese manufacturing process of continuous improvement that is the responsibility of everyone.

The New York City school district is broken down into smaller units. District 2 in Upper Manhattan has taken a unique approach to improve the quality of teaching in its schools.

To improve teachers:

- 1) Teachers have to be able to observe good teachers
- 2) Teachers have to be coached, to practice lessons, and to reflect on how to perform better

Most K-12 teachers spend the day alone in their own classrooms, which is very isolating unless they and their school administrators work hard to make time available to discuss and collaborate.

In NYC District 2, there are several kinds of teachers

- 1) Resident teachers
- 2) Adjunct teachers
- 3) Regular teachers

Resident teachers allow other teachers to visit and work with them to boost their teaching skills. Adjunct teachers temporarily take over the classrooms of regular teachers to allow them to observe resident teachers.

The process is as follows: Regular teachers work with resident teachers for 3 full weeks. In the week prior, an adjunct teacher visits the regular teacher's classroom to prepare for taking over the regular teacher's classroom. Following the 3 weeks of observation and teaching with the resident teacher, the regular teacher is given follow up coaching and assistance.