14.48, Economics of Education
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Lecture 17

1) How do you measure a fair standard against which to measure school performance?
2) How do we assess whether the Dallas program worked?

When we want to know whether or not a school is doing well, we could:
--compare schools against the average test score for a certain grade. Comparing schools with low SES students against schools with high SES students might elicit complains from politicians, parents, school administrators, etc because you aren't account for inherent differences in what resources schools have to work with and where they are starting from.
--compare a schools based on how much they improved over the course of the year. However, we may be penalizing high performing schools because they have less room for improvement than lower performing schools. You also need to decide how you are going to measure improvement.
You could take the average of the following, across all students in every school of interest:

$$(TestScore)_{it} - (TestScore)_{it-1}$$

Looking at absolute test scores might distort the effects of different reforms. As mentioned earlier, how much you are expected to improve should have some basis in the socioeconomic status and starting points of the students in a particular school. If potential improvement in a student's score depends on where he started from, we need some way of measuring the starting point.

South Carolina:
A regression was used to estimate a predicted score for each individual student and improvement was the difference between the predicted score and the actual score.

For example, for each student in a 5th grade reading class:

$\hat{S}_6$ = Predicted 6th grade reading score

S_6 = Actual 6th grade reading score

Rewards are based on the difference between the predicted and actual 6th grade reading score:

$$\left(S_6 - \hat{S}_6 \right)$$

What if we instituted a passing standard/cutoff score and based rewards on the fraction of students who pass the exam?
Teachers would then have an incentive to focus most of their teaching efforts on students who just missed passing the exam the previous year because tudents who did very well do not need his or her help to pass and students who are very low performing would need to much extra help to pass.

How do we calculate $\hat{S}_6$?

$$\hat{S}_6 = \alpha_0 + \beta_1 R_{5i} + \beta_2 M_{5i} + \beta_3(R_{5i}, M_{5i}) + \beta_4(R_{5i})^2 + \beta_4(M_{5i})^2$$

Once we've calculated the predicted test scores, we look at the year to year changes in each school.
What about random noise? Of course there will be random noise, if only because of the changing demographics in schools over time. All students can have good and bad days which can affect their test scores. Additionally, student absences on testing days affect a school's overall score. The smaller the school, the larger the random variation in test scores from year to year.

Dallas:

Texas instituted a yearly achievement testing called the TAAS in 1990, which was actually the basis for much of President Bush's thinking on NCLB.

In the 1991-1992 school year, Dallas started it's teacher incentives program. Let's assume that school achievement is measured fairly.

Our dependent variable is the pass rate in school i for the 7th grade:
$P_{i,7}$

How do you test whether the Dallas incentive program actually had any affect:
Use a differences-in-differences approach comparing the scores across multiple years from multiple cities.

Set Up:
Data available—
School characteristics including the percentage of students that are Black, Hispanic, eligible for free lunch or have English difficulties as well as 7th grade TAAS pass rates from 1991-1994 for schools in Dallas, Houston, Fort Worth, San Antonio, El Paso, and Austin.

$$P_{i,t} = \alpha_0 + \left(\sum_{i=1}^{6} \beta_i (SchoolCharacteristics)_{i,t}\right) + \left(\sum_{i=1}^{5} \gamma_i (City)_i\right) + \left(\sum_{i=1}^{3} \delta_i (Year)_i\right)$$

How do we extend this model to testing the Dallas program effects?
We need an interaction term between the Dallas city dummy variable and the year dummy variables for 1992 and after.

$$P_{i,t} = \alpha_0 + \left(\sum_{i=1}^{6} \beta_i (SchoolCharacteristics)_{i,t}\right) + \left(\sum_{i=1}^{5} \gamma_i (City)_i\right) + \left(\sum_{i=1}^{3} \delta_i (Year)_i\right) + \left(\sum_{i=1}^{3} \lambda_i (Year)_i * (Dallas)\right)$$

If the program works, then λ_i should be significantly different from 0.